## What is a Database

"A database is a collection of related data". Elmasri, R. & Navathe, S.B. 2001

"Database is a collection of data, or information, that is specially organized for rapid search and retrieval by a computer." Encyclopaedia Britannica

"A collection of persistent data that can be shared and interrelated." Manino, M. 2007

# **Properties of Databases**

Persistent means that data reside on stable storage such as a database server hard disk drive or a database serve cloud.

**Shared** means that a database can have multiple uses and users.

Interrelated means that data stored as separate units can be connected to provide a whole picture, to order data and facilitate order processing

# **Database Management Systems**

"A database-management system (DBMS) is a collection of interrelated data and a set of programs to access those data. The collection of data, usually referred to as the database, contains information relevant to an enterprise. The primary goal of a DBMS is to provide a way to store and retrieve database information that is both convenient and efficient." Silberschatz, A., Korth, H. F. & Sudarshan, S. 2011

"A database management system (DBMS) is a collection of programs that enables users to create and maintain a database. The DBMS is a general-purpose software system that facilitates the processes of defining, constructing, manipulating, and sharing databases among various users and applications." Elmasri, R. & Navathe, S.B, 2011

"A database management system (DBMS) is a collection of components that supports the creation, use, and maintenance of databases. It provides a broad range of features for data acquisition, storage, dissemination, maintenance, retrieval, and formatting." Manino, M. 2007

# **Relational Databases**

 A relational database consists of a collection of tables, each of which is assigned a unique name.

Represents the database as a collection of relations

gives us a single way to represent data: as a two-dimensional table

## **Basic Elements of Relational Databases**

#### **Tables or Entities:**

Represent real-world objects or concepts

Are assigned unique names

#### **Attributes:**

An attribute describes the meaning of entries in the column below.

Refers to a column of a table or column names.

Represent some properties of interest that further describes an entity

### **Tuples or Rows:**

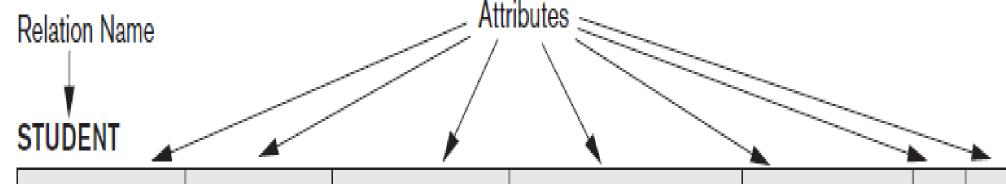
These are a sequence or list of values.

Sometimes are called Records

#### **Domains or Data Type**

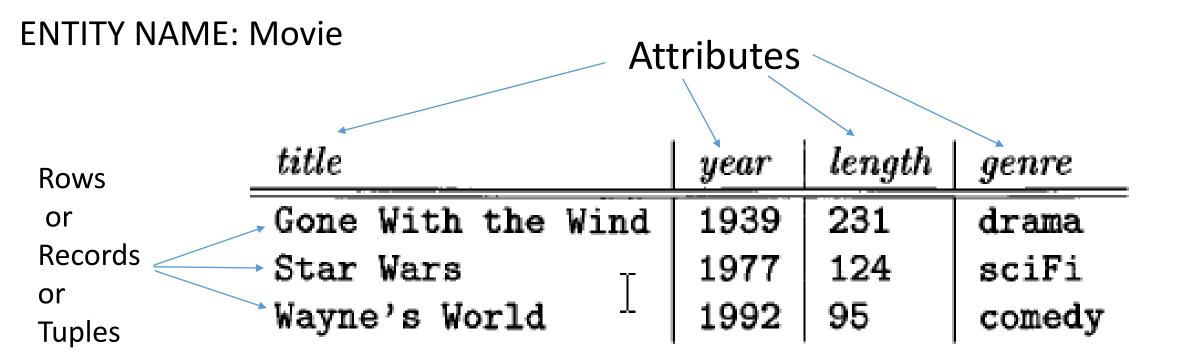
Data types indicate the kind of data (character, numeric, Yes/No, etc.) and permissible operations (numeric operations, string operations etc.) for the column.

# Table Name or Entities or



Rows or Records or

				3			
	Name	Ssn	Home_phone	Address	Office_phone	Age	Gpa
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Benjamin Bayer	305-61-2435	(817)373-1616	2918 Bluebonnet Lane	NULL	19	3.21
	Chung-cha Kim	381-62-1245	(817)375-4409	125 Kirby Road	NULL	18	2.89
	Dick Davidson	422-11-2320	NULL	3452 Elgin Road	(817)749-1253	25	3.53
	Rohan Panchal	489-22-1100	(817)376-9821	265 Lark Lane	(817)749-6492	28	3.93
	Barbara Benson	533-69-1238	(817)839-8461	7384 Fontana Lane	NULL	19	3.25



Movies(title:string, year:integer, length:integer, genre:string)

Domain

or

Data Type